vegetation on the moraine deposited by the last ice sheet; (2) a forest of birch and hazel; (3) a layer of arctic-alpine plants, occurring down to sea level in Shetland; (4) a forest of pine, hazel, and birch, occurring up to 3200 feet; (5) a layer of peat, accumulated from stage 4 to the present day, consisting entirely of moorland plants. This means an alternation of two forest beds with two arctic beds, before the peat came in.—J. M. C.

The structure of Mesoxylon.—In 1910, SCOTT and MASLEN published *Mesoxylon* as a new genus of Cordaitales, which included five species. One of these, *M. Sutcliffii*, has now been studied by MASLEN,[23] so far as the structure of stem and leaf is concerned. The name of the genus refers to the fact of its intermediate position between *Cordaites* and *Poroxylon*, and the known species appear to bridge the gap almost completely. The present study confirms this original conclusion, the particular species studied being much nearer to *Cordaites* than *Poroxylon*. A condensed summary is given of the resemblances of *M. Sutcliffii* to each of these genera, and also its differences in each case. One of the most interesting features of *Mesoxylon* is that it illustrates the gradual extinction of centripetal wood and the establishment of endarch structures in the *Cordaites*.—J. M. C.

The chromosomes of Dahlia.—ISHIKAWA[24] finds 16 and 32 chromosomes in *Dahlia coronata*, but 32 and 64 in nine other species and races. In the pollen mother cells of *D. coronata* in the heterotypic prophase, the chromosomes are paired, but in the other species the pairing is seen also at the homotypic mitosis, indicating, according to ISHIKAWA, that the vegetative cells of these species are tetraploid.

From the literature and his own observations, the reviewer has tabulated the number of chromosomes in more than 30 species of composites, and finds that the number varies from 3–6 in *Crepis virens* to 21–42 in *Hieracium flagellare*, with 8–16 or 9–18 as the most usual numbers. The extraordinary variety of form in Compositae may be related to the variation in the chromatin.—CHARLES J. CHAMBERLAIN.

Proteolytic enzyme of Drosera.—The proteolytic enzyme of four species of *Drosera* (*D. auriculata*, *D. Menziesii*, *D. peltata*, *D. Whittakeri*) has been investigated by Miss JEAN WHITE,[25] who finds a pepsin-like enzyme present in all of them, but unassociated with any peptolytic or tryptic enzyme. Peptic digestion occurred either in acid, basic, or neutral medium, every test giving a good biuret reaction for peptones; but in no instance could the faintest trace of amides be found with the tryptophane reaction. This dis-

[23] MASLEN, ARTHUR J., The structure of *Mesoxylon Sutcliffii* (Scott). Ann. Botany **25**:381–414. *pls. 33–36*. 1911.

[24] ISHIKAWA, M., Cytologische Studien über Dahlien. Bot. Mag. Tokyo **25**:1–8. *pl. 1*. 1911.

[25] WHITE, JEAN, The proteolytic enzyme of *Drosera*. Proc. Roy. Soc. London B **83**:134–139. 1911.

covery is interesting, since it is the only record of a peptase occurring in plants unassociated with ereptase. The enzyme is present as such, not in the form of zymogen. The leaves of *Drosera* were found to be capable of absorbing dissolved peptones from liquids placed on their surfaces in a few hours.—CHARLES A. SHULL.

Hepaticae in Scotland.—MACVICAR[26] has published a full account of the liverworts of Scotland, stating that "this work may be regarded as a new departure for Scotland in this branch of botany," previous publications having been fragmentary. An ecological discussion of nearly 50 pages precedes the list, the latter including a full list of stations under each species. Among other interesting facts of distribution, the altitudes to which species ascend may be mentioned. Of the 225 species included in the list, 20 ascend above 4000 ft., 61 reach 3000–4000 ft., and 32 reach 2000–3000 ft.; which means that half of the Scottish species ascend above 2000 ft. There are 67 genera recognized in the list, those including 10 or more species being *Lophozia* (26), *Scappania* (20), *Marsupella* (13), and *Cephalozia* (10).—J. M. C.

A cretaceous Pityoxylon with ray tracheids.—It has been supposed that the occurrence of ray tracheids in the pinelike conifers is more recent than the Cretaceous, so that their discovery by BAILEY[27] in a *Pityoxylon* from the Upper Cretaceous of New Jersey is one of considerable interest. The species represents a structure intermediate between the older cretaceous pines and the most primitive of living pines; and the infrequent occurrence of ray tracheids in the older portions of the stems and their entire absence from the younger wood are taken to indicate that these structures are of recent origin and are not strongly fixed upon the plant. This shifts the development of ray tracheids from the Tertiary to the Upper Cretaceous.—J. M. C.

Longevity of seeds.—Miss REES[28] has made a study of the relation existing between the structure and permeability of the coats and the longevity of seeds. In general, the macrobiotic seeds (retaining vitality for more than 15 years) belong to the legumes and have highly cutinized coats. *Eucalyptus calophylla* and *E. diversicolor* are exceptions. They possess no impervious covering, and, contrary to the general situation for macrobiotic seeds, they are large and very rich in oils.—WILLIAM CROCKER.

Laboratory air.—NELJUBOW[29] has studied the growth of the pea seedling in laboratory air and comes to the following conclusions: Ethylene is the

[26] MACVICAR, SYMERS M., The distribution of Hepaticae in Scotland. Trans. and Proc. Bot. Soc. Edinburgh **25**:vi+336. 1910.

[27] BAILEY, I. W., A cretaceous *Pityoxylon* with marginal tracheids. Ann. Botany **25**:315–325. *pl. 26*. 1911.

[28] REES, BERTHA, Longevity of seeds and structure and nature of the seed coat. Proc. Roy. Soc. Victoria N.S. **23**:393–414. 1911.

[29] NELJUBOW, D., Geotropism in der Laboratoriumsluft. Ber. Deutsch. Bot. Gesells. **29**:97–112. 1911.